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# SURF ResearchCloud Community Engagement

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# Participant introductions

- Please state your name & affiliation
- Your role in the organization
- Any prior exposure to “SURF ResearchCloud”?
  
- Optional: particular interests, what do you expect to learn this workshop?

# Agenda

- The bigger picture
- The project
- Our approach
- The cloud service
- (interim) Results
- Call to action

# The bigger picture



The vast majority of researchers is unable to utilize large-scale IT compute services

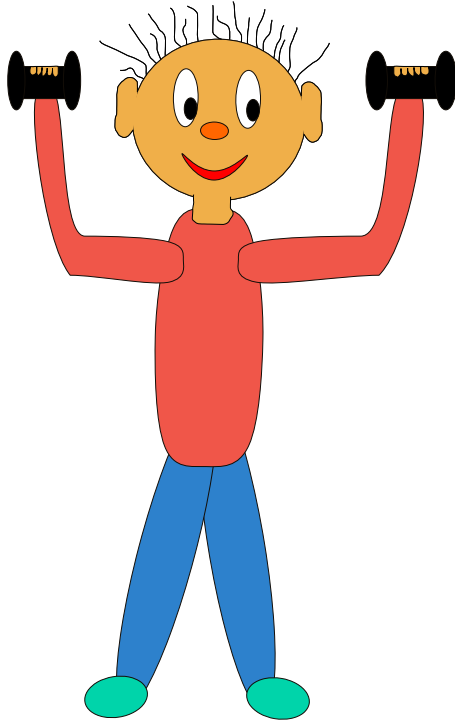
# Significant impact on research

- **Impact on researcher's realistic ambitions**
  - use a more limited data set (e.g. lower accuracy)
  - limit number of analysis runs or experiments
  - limit processing of data (e.g. not sensitive)
- **Impact on research project time: €€€**
  - Increased time spent on building specialist IT skills at the expense of research time
  - “captured” laptop workstations (due to multi-day runs)

# Significant impact on research

Slows down research, frustrates researchers !

# What many researchers need



powerful compute service

*and*

easy to use / operate

***“SURF Research Cloud is a portal for building virtual research workspaces efficiently” (surf.nl)***

# Our project

- **Our consortium's ambition:**

*Maximize the **benefits for researchers** obtained from using **SURF Research Cloud (SRC)**, by building a **cross-organizational support community**, along with best practices and software configurations*

- **“Investments in digital Research Infrastructure” (NWO)**
  - “SRC Community Engagement” in response to a CfP
  - Co-funded total 2 internal-FTE, 1 year (Jan-Nov 2022)



# Project coordinated by

- TU/e : Toine Kuiper
- WUR : Erik van den Bergh
- UU : Ton Smeele
- HU : Margreet Riphagen
  
- SURF : Ivar Janmaat (support to project)
  
- Project Management: Erik Hakvoort (UU)

# Approach

- **Community**
  - Events, consortium partners participate, open to others
  - Coordinators have monthly heartbeat meetings
- **Best practices**
  - Share, analyze and document practices
  - Technical leads
- **“plugin” software development**
  - Agile, prototyping, use case driven
  - Support, bias towards cross-institute, research projects

# SURF Research Cloud is...

*“Provide researchers with easy access to powerful cloud computing resources, so that they can, jointly, analyze research data”*

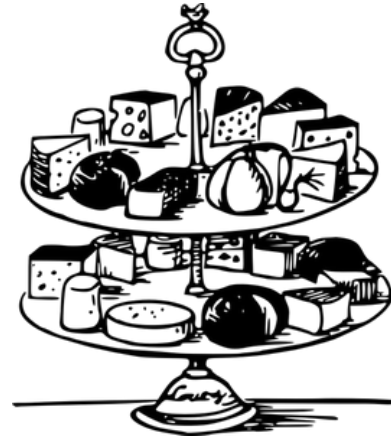
- Does not require extensive IT expertise to use
- Can be used collaboratively by an informal consortium of people, originating from different institutes
- Pay-per-use model, choice of (commercial and edu) cloud providers. SURF = broker

# Solution consists of three components



## GROUP OF USERS

Create a “CO”  
virtual organization  
(SRAM)



## APPLICATION SOFTWARE NEEDED

Select workspace type  
from a catalog ...  
(Research Cloud portal)



## CLOUD PROVIDER AND HARDWARE NEEDED

... and click to  
create such a workspace  
(on HPC Cloud, Azure, ...)

# SURF Research Access Management

- “Collaboration” (CO) specifies “project” and members
  - This is in essence a **cross-organization virtual organization**
  - Members are from institutes (using their institutional account) or join on a personal basis (EduID)
  - Authentication via SURFConext
- The CO can decide to make use of Services
  - SURF Research Cloud is such a service
  - All CO members have access to the service



# SURF ResearchCloud portal

- Easy deployment of compute resources from a catalog
  - Click-to-select wizard to specify:
    - Workspace type (= software configuration)
    - Cloud provider (= hardware configuration)
    - Collaboration (CO = set of authorized users)
    - Wallet (= account to pay for usage)
- Manage workspace
  - Inspect / Access
  - Pause / Resume / Delete












# Research Cloud: Extensible catalog

## Catalog

Here you find information on all available applications and datasets. You can request access to these by selecting the specific item. Our helpdesk will review your request and will inform you about the next steps. After completion you will be granted access to the items within the workspace creator. Note: You can also add your own dataset or application. With this you can help your fellow researchers!

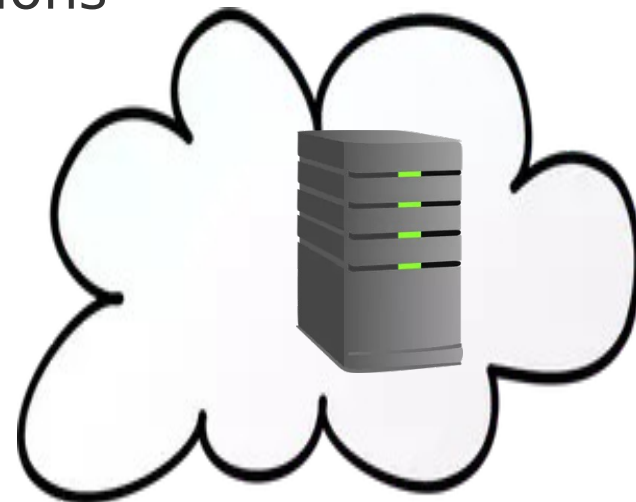
Applications   Datasets   Storage

 <b>Jupyter Notebook with R-Kernel</b> Jupyter Notebook with R-Kernel	 <b>Keycloak Server</b> On Ubuntu Desktop with Sudo	 <b>Matlab SustainIndus</b> Matlab Owncloud
 <b>Matlab Workbench</b> Matlab, Python, PyEnv, Poetry, iRODS, Docker.	 <b>Matlab Workbench VM</b> Matlab	 <b>Python/Docker Workbench</b> Python, PyEnv, Poetry, iRODS, Docker.
 <b>Python Workbench commandline</b> Python, PyEnv, Poetry - commandline only	 <b>R-Studio</b> R-Studio on Ubuntu VM (R version 3)	 <b>R-Studio Jobdigger</b> R-Studio on Ubuntu VM (R version 3)

Linux workspace for Python application development. Configuration includes Python, PyEnv and Poetry, Yoda data synchronization app and iRODS icommands, Docker and Docker-Compose. Access to workspace via browser or ssh. Users have sudo rights allowing them to install additional software.

# Cloud provider: compute resources

- The workspace
  - Informally a virtual machine with options
  - Configured with Windows or Linux
  - Workspace *creator* accountable for costs from use by any CO member
- Access methods
  - (graphical) Remote Desktop (RDP)
  - (graphical) Web browser (HTTP)
  - Commandline (SSH)





# Demo - SURF ResearchCloud

- Select and deploy a workspace from the catalog
- Operate/manage a workspace
- Methods for accessing the workspace
- Extensibility of the catalog

*We use a workspace type created by the project team*

# Project activities

- **Getting the paperwork done!** (December - April)
  - legal/fiscal reviews, Consortium agreement → template!
  - Per institute preparations to setup SRC as a service
- **Research project use cases** (February - ... now)
  - Communication activities (alliance staff, practices, ...)
  - Requirements analysis (with researchers)
  - Development of software plugins
  - Provide support to researchers on using SRC
- **Best practices working group** (April - November)

# Events

January 13	(virtual)	<b>SRC Technical Introduction workshop</b> - project team training - 18 attendees from 4 organizations
March 16	Utrecht	<b>SRC Hackathon</b> - in close cooperation with SURF - 14 participants from 6 organizations
April 19	Eindhoven	<b>EWUU alliance annual research conference</b> - networking with 300+ researchers

# What have we learned (so far)

- **Working across borders requires significant extra efforts**
  - Different starting points, culture, policies & priorities
- **Yet it can be done!**
  - Build/maintain the relation with informal regular meetings
  - Transparency and understanding → trust
  - Common goals → results
- **And it is fun and addicting!**
  - Facing the same challenges together

# What we learned about SRC - 1

- **Easy for researchers: deploy and use workspaces**
  - Researchers + Research Engineers appreciate service
  - Popular applications: Python, R-Studio, Matlab
- **Effort to support: extend catalog will require IT skills**
  - Plugins: write Ansible scripts to install software
  - Assemble applications: some understanding of IT stack
- **Use cases**
  - Suitable to process many types of data
  - Very sensitive data not yet supported – using alternative

# What we learned about SRC - 2

- **Service is currently aimed directly at researcher**
  - Limited features for support staff to help out researcher
  - Account/wallet setup takes time, and involves researcher
  - Method for sharing/reuse of plugins can be improved
- **Pleased with SURF team support**
  - Excellent cooperation, open to improve/extend service

# Recommended to get started

- **Have one or two champions trained in your organization**
  - Position SRC services within own organization
  - Help out researcher on first steps, unburden
  - Possibly extend catalog to support more use cases
- **Champion profile**
  - IT Consulting
  - Affinity with research
  - System admin / system programmer skills

# Next event: Hackathon (Eindhoven)

(t.b.d. Sept 19, 20 or 21)

- **Morning: Beginners training**

- Understand the SRC concepts
- Deploy a virtual research environment using SRC
- Build and configure your first “plugin”

- **Afternoon: Hackathon**

- Jointly work on a challenge to extend the SRC catalog
- Optional: bring your own SRC software challenge
- Network with peers from SURF and institutes



==> email [e.h.hakvoort@uu.nl](mailto:e.h.hakvoort@uu.nl) to request to be added to the events mailing list



# Summary

- **Researchers need easy-to-use compute resources**
  - Our experience is that SRC helps to close the gap
- **Community aids to lower support cost**
  - Reuse each others results (share plugins)
  - Exchange best practices
- **DCC project = catalyze the process**



# Discussion

- Do you/researchers have similar needs?
- Which facilities do you provide / are used today?
- Which challenges do you face?